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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,339	10/20/2003	Daniel Eduardo Groszmann	134074NV (15084US01)	2897

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EXAMINER	
TANINGCO, ALEXANDER H	

ART UNIT	PAPER NUMBER
2882	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/689,339	GROSZMANN, DANIEL EDUARDO	
	Examiner	Art Unit	
	ALEXANDER H. TANINGCO	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/08/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

Receipt of the Information Disclosure Statement (IDS) with copies of the reference cited therein, was received on 11/08/2007. An initialized copy of the IDS is enclosed with this office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graumann et al. (US 6,382,835), Wantanabe (US 6,325,537), Navab et al. (US 6,236,704), Fujii et al. (US 6,609,826), Berestov (US 2003/0113006), and in further view of Grover et al. (US 5,200,700).

With regards to claims 1 and 9, Graumann et al. disclose a method for image reconstruction for images acquired in a non-isocentric path (Col. 2 Lines 29-30), said method comprising: varying a distance between an object and at least one of a detector and a source (Col. 2 Lines 29-30); and reconstructing an image of said object based on said image data (Col. 1 Lines 9-12).

Graumann et al. fail to explicitly teach a method further comprising the steps of: varying a distance between an object and at least one of a detector and a source to form a virtual isocenter; maintaining an object at said virtual isocenter during imaging of

said object; normalizing a magnification change in image data obtained as said virtual isocenter is maintained; and reconstructing an image of said object based on said image data and said normalized magnification change.

Watanabe teaches a method comprising: varying a distance between an object and at least one of a detector and a source to form a virtual isocenter (Col. 3 Lines 55-64; Col. 4 Lines 31-37). It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the invention of Graumann et al. to include the features of Watanabe. One would have been motivated to make such a modification to improve positioning to a wide range of diagnostic uses as taught by Watanabe (Col. 2 Lines 30-35).

Navab et al. teach a method comprising a step of: varying distance between an object and at least one of a detector and a source to form a virtual isocenter (Col. 1 Lines 55-60); and reconstructing an image of said object based on said image data (Col. 1 Lines 59-61). It would have been obvious to one of ordinary skill in the art, at the time of invention to further modify the invention of Graumann et al. to include the features of Navab et al. One would have been motivated to make such a modification to improve computations as taught by Navab et al. (Abs.)

Fujii et al. teach a method comprising a step wherein a C-arm is moved in a vertical and horizontal direction (Fig. 1 note: a, b, g, and d); and setting a distance between a subject and an X-ray tube focus point of X-ray tube device, and distance between an object and an X-ray image reception device (Col. 11 Lines 25-38). It would have been obvious to one of ordinary skill in the art, at the time of invention to further

modify the invention of Graumann et al. to include the features of Fujii et al. One would have been motivated to make such a modification to improve positioning to a wide range of diagnostic uses as implied by Fujii et al.

Berestov teaches a method comprising the step of: normalizing a magnification change in image data obtained as said virtual isocenter is maintained [0067; 0073; and 0081]. It would have been obvious to one of ordinary skill in the art, at the time of invention to further modify the invention of Graumann et al. to include the features of Berestov. One would have been motivated to make such a modification to improve image registration as taught by Berestov [0067].

Grover et al. teaches a method comprising the step of: normalizing a magnification change in image data obtained as said virtual isocenter is maintained; maintaining an object at said virtual isocenter during imaging of said object (Col. 8 Line 28 - Col. 10 Line 12). It would have been obvious to one of ordinary skill in the art, at the time of invention to further modify the invention of Graumann et al. to include the features of Glover et al. One would have been motivated to make such a modification to reduce artifacts thus improving image quality as taught by Glover et al. (Col. 8 Lines 25-35).

With regards to claims 2 and 10, Graumann et al. as modified above discloses a method comprising a step of tracking a position of said detector and a position of said object (Col. 4 Lines 62-67).

With regards to claim 3, Graumann et al. as modified above discloses a method comprising a step wherein said varying step further comprises varying said distance between image exposures (Col. 5 Lines 25-30).

With regards to claim 4, Graumann et al. as modified above discloses a method further comprising determining a distance between said detector and a source (Col. 1 Lines 55-60 Navab et al.).

With regards to claim 5, Graumann et al. as modified above discloses a method further comprising determining a position of at least one of said detector and a source with respect to said object (Col. 3 Lines 25-27 Watanabe).

With regards to claim 6, Graumann et al. as modified above discloses a method further comprising mounting said detector and a source on a C-arm (Fig. 1).

With regards to claim 7, Graumann et al. as modified above discloses a method further comprising moving said C-arm in a non-circular path to move said detector and said source around said object while varying said distance between said detector and said object (Col. 2 Lines 29-30).

With regards to claim 8, Graumann et al. as modified above discloses a method comprising a step wherein said reconstructing step further comprises reconstructing a three-dimensional image of said object based on said image data and said normalized magnification change (Col. 1 Lines 7-13).

With regards to claim 12, Graumann et al. as modified above discloses a method further comprising a step of reconstructing at least one image of said object from said image data adjusted for said change in magnification (Col. 1 Lines 7-13).

With regards to claim 13, Graumann et al. as modified above discloses a method further comprising a step of maintaining a position of said object at a virtual isocenter formed by varying said distance between said object and at least one of said source and said detector (Col. 8 Line 8 – Col 10 Lines 15 Glover et al.).

With regards to claim 14, Graumann et al. as modified above discloses a method further comprising a step of: moving a support including said detector and a source in an orbital motion to move said detector and said source around said object while varying said distance between said detector and said object (Fig. 1 note: a, b, g, and d Fujii et al.).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graumann et al. (US 6,382,835), Wantanabe (US 6,325,537), Navab et al. (US 6,236,704), Fujii et al. (US 6,609,826), Berestov (US 2003/0113006), and Grover et al. (US 5,200,700) as applied to claim 10 above, and further in view of Umebayashi (JP 58190702 A).

With regards to claim 11, Graumann et al. as modified above discloses a method as recited above in claim 10. Graumann et al. as modified above fails to teach a method further comprising a step wherein said tracking system comprises an electromagnetic tracking system for determining a position of said detector with respect to said object. Umebayashi teaches a method comprising a step wherein said tracking system comprises an electromagnetic tracking system for determining a position of said detector with respect to said object (Abs.). It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the invention of Graumann et

al. to include the features of Umebayashi. One would have been motivated to make such a modification to improve measurements as taught by Umebayashi (Abs.).

Claims 15, 16, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graumann et al. (US 6,382,835), Fujii et al. (US 6,609,826), Berestov (US 2003/0113006), and in further view of Grover et al. (US 5,200,700).

With regards to claim 15, Graumann et al. disclose a system for processing images obtained using non-isocentric motion, said system comprising: a source **8** for providing an emission used to generate an image of an object **19**; a detector **9** for receiving said emission after said emission has traveled through said object to produce image data; a support for positioning **7** said source and said detector; a tracking system for obtaining position data relating to at least one of said source, said detector, and said object (Col. 4 Lines 62-67); and an image processor **13** for reconstructing at least one image using said image data and said position data (Fig. 1).

Graumann et al. fails to explicitly teach an apparatus further comprising:said support varying at least one of a distance between said detector and said object and a distance between said source and said object when obtaining said image data from said emission; and an image processor compensating for a change in magnification between image data when reconstructing said at least one image.

Fujii et al. teach an apparatus comprising said support varying at least one of a distance between said detector and said object and a distance between said source and said object when obtaining said image data from said emission (Fig. 1 note: a, b, g, and d). It would have been obvious to one of ordinary skill in the art, at the time of invention

to modify the invention of Graumann et al. to include the features of Fujii et al. One would have been motivated to make such a modification to improve positioning to a wide range of diagnostic uses as implied by Fujii et al.

Berestov teaches an apparatus comprising: an image processor compensating for a change in magnification between image data when reconstructing said at least one image [0067; 0073; and 0081]. It would have been obvious to one of ordinary skill in the art, at the time of invention to further modify the invention of Graumann et al. to include the features of Berestov. One would have been motivated to make such a modification to improve image registration as taught by Berestov [0067].

Grover et al. teach an apparatus comprising an image processor compensating for a change in magnification between image data when reconstructing said at least one image (Col. 8 Line 28 - Col. 10 Line 12). It would have been obvious to one of ordinary skill in the art, at the time of invention to further modify the invention of Graumann et al. to include the features of Glover et al. One would have been motivated to make such a modification to reduce artifacts thus improving image quality as taught by Glover et al. (Col. 8 Lines 25-35).

With regards to claim 16, Graumann et al. as modified above discloses an apparatus wherein said change in magnification is due to varying at least one of a distance between said detector and said object and a distance between said source and said object [0067; 0073; and 0081 Berestov].

With regards to claim 19, Graumann et al. as modified above discloses an apparatus wherein said support **7** comprises a C-arm (Fig. 1).

With regards to claim 20, Graumann et al. as modified above discloses an apparatus further comprising a positioning device for positioning said object with respect to said support [0004 Berestov].

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graumann et al. (US 6,382,835), Fujii et al. (US 6,609,826), Berestov (US 2003/0113006), and Grover et al. (US 5,200,700) as applied to claim 15 above, and further in view of Umebayashi (JP 58190702 A).

With regards to claim 17, Graumann et al. as modified above disclose an apparatus as recited above in claim 15. Graumann et al. as modified above fail to explicitly teach an apparatus wherein said tracking system comprises an electromagnetic tracking system. Umebayashi teaches an apparatus wherein said tracking system comprises an electromagnetic tracking system (Abs.). It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the invention of Graumann et al. to include the features of Umebayashi. One would have been motivated to make such a modification to improve measurements as taught by Umebayashi (Abs.).

With regards to claim 18, Graumann et al. as modified above discloses an apparatus wherein said tracking system comprises an electromagnetic sensor located on said detector and an electromagnetic transmitter located on said object (Abs.).

Response to Arguments

Applicant's arguments with respect to claims 1, 9, and 15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show:

Earl et al. (US 6,456,383) (356/614)

- Determining an absolute distance between a detector of electromagnetic radiation energy and a target

Nakamura et al. (US 5,930,328) (378/91)

- Correcting magnification ratio

Boutenko et al. (US 7,194,065) (378/108)

- Geometric enlargement is when either object or the source or detector is moved along an axis of a beam
- If enlargement ratio, equal to the SID/SOD ratio, is modified without, changing the SID number of X photons crossing the detail of interest will be modified according to the square of that ratio

Senzig et al. (US 7,016,457) (378/19)

- Magnification factor of a system by be modified

Webber et al. (US 6,810,278) (600/407)

- Relative magnification factor can be used to determine the distance of a source from an object

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER H. TANINGCO whose telephone number is (571)272-8048. The examiner can normally be reached on Mon-Fri 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander H Taningco/
Examiner, Art Unit 2882

/Courtney Thomas/
Primary Examiner, Art Unit 2882